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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/712,236	11/12/2003	Shiao-Shien Chen	JCLA11795	9474
7590		08/24/2004	EXAMINER	
J.C. Patents, Inc.		HU, SHOUXIANG		
Suite 250				
4 Venture		ART UNIT		
Irvine, CA 92618		2811		
		PAPER NUMBER		

DATE MAILED: 08/24/2004

Please find below and/or attached an Office communication concerning this application or proceeding.

## Office Action Summary

**Application No.**

10/712,236

**Applicant(s)**

CHEN ET AL.

**Examiner**

Shouxiang Hu

**Art Unit**

2811

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☐ Responsive to communication(s) filed on \_\_\_\_.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 1-18 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-18 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☒ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 12 November 2003 is/are: a) ☐ accepted or b) ☒ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
  - ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_.
  - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- |  |   |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)  | 4) <input type="checkbox"/> Interview Summary (PTO-413)<br>Paper No(s)/Mail Date. ____. |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)                                   | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152)             |
| 3) <input type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)<br>Paper No(s)/Mail Date ____. | 6) <input type="checkbox"/> Other: ____.  |

## DETAILED ACTION

### *Drawings*

1. The drawings are objected to because in Fig. 5, the leakage current curves (510b-540b) appear to be misplaced horizontally with respect to the current curves (510a-540a).

Corrected drawing sheets in compliance with 37 CFR 1.121(d) are required in reply to the Office action to avoid abandonment of the application. Any amended replacement drawing sheet should include all of the figures appearing on the immediate prior version of the sheet, even if only one figure is being amended. The figure or figure number of an amended drawing should not be labeled as "amended." If a drawing figure is to be canceled, the appropriate figure must be removed from the replacement sheet, and where necessary, the remaining figures must be renumbered and appropriate changes made to the brief description of the several views of the drawings for consistency. Additional replacement sheets may be necessary to show the renumbering of the remaining figures. The replacement sheet(s) should be labeled "Replacement Sheet" in the page header (as per 37 CFR 1.84(c)) so as not to obstruct any portion of the drawing figures. If the changes are not accepted by the examiner, the applicant will be notified and informed of any required corrective action in the next Office action. The objection to the drawings will not be held in abeyance.

### ***Specification***

2. The disclosure is objected to because of the following informalities and/or defects:

In Paragraphs 0033 and 0042, the term of "do not conduct" does not seem to be appropriate, since the emitter (208) and the base (206) are actually shortened together, as shown in Figs. 2 and 3 of the instant disclosure.

Appropriate correction is required.

### ***Claim Objections***

3. Claims 1-18 are objected to because of the following informalities: and/or defects:

Claims 1, 5 and 12 each recite multiple terms of "a first (or, second) conductivity type", but fail to define the relationship between them. For example, the term of "a first conductivity type second well region" should read as: --a second well region of the first conductivity type--.

Claims 6 and 13 recites the terms of "each diode" and "following diode", but fail to clarify where the "following" diode is also readable as the "each diode", as at the last diode does not have a "following diode" in a diode string.

Claims 7, 8, 14 and 15 each recite the terms of "the first region", "the second region" and/or "the third region", but fail to clarify which diode they belong to.

In claim 12, the term of "wherein the first doped region and the second" should read as: --wherein the second doped region and the third--.

Art Unit: 2811

In claim 13, the term of "a third" should read as: --the third--.

Appropriate correction is required.

***Claim Rejections - 35 USC § 102***

4. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

5. Claims 1 and 4, as being best understood in view of the claim objections above, are rejected under 35 U.S.C. 102(b) as being anticipated by Yagi (JP 6-104459, 4/15/1994).

Yagi discloses a diode structure (11b in 10), comprising: a substrate of a first conductive type (11; P); a first well region of a second conductive type (13; N); a second well region located within the first well region (15; P); a first doped region (18; N) within the first well region and detached from the second well region but adjacent to the surface of the substrate; and a second doped region (20) and third doped region (23; N) located within the second well region and adjacent to the surface of the substrate, wherein the second doped region is located between the first doped region and the third doped region but detached from both the first doped region and the third doped region.

***Claim Rejections - 35 USC § 103***

6. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

7. Claims 2, 3, and 5-18, as being best understood in view of the above claim objections, are rejected under 35 U.S.C. 103(a) as being unpatentable over Applicant's admitted prior art ("AAPA") in view of Yagi.

AAPA (see Fig. 1, and also see Paragraphs 0004 through 0007 of the instant disclosure) disclose the claimed invention except that AAPA does not expressly disclose that the individual diode(s) therein can be formed with a triple-well structure.

However, one of ordinary skill in the art would readily recognize that such triple-well structure is desirable for eliminating the adverse parasitic transistor effect therein, as evidenced in Yagi (whose disclosure is discussed as applied to claims 1 and 4 above; see the triple-well structure in Fig. 10, also see the English abstract).

Therefore, it would have been obvious to one of ordinary skill in the art at the time the invention was made to incorporate the triple-well diode structure of Yagi into the diode structure of AAPA, so that a diode or diode string without the adverse parasitic transistor effect would be obtained.

Regarding claims 3, 10 and 17, it is noted that the diode structure of AAPA further includes a first STI (107) between the neighboring diodes and a second STI (107) between the two electrode contact regions in each diode. And, it would be well

Art Unit: 2811

within the ordinary skill in the art to form the above collectively taught diode structure with the STI therein being formed between each pair of the neighboring electrode contact regions for improving the separation the neighboring electrode contact regions, as evidenced in the prior art such as Santin et al. (US 5,815,026; see the surface isolation regions between the electrode contact regions 24", 26" and 16" in Fig. 4).

Regarding claims 12-18, it is noted that the first well regions in the above collectively taught diode structure can be naturally regarded as being included in a big first well region.

### ***Conclusion***

8. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. References A-D are cited as being related to a triple-well diode structure.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Shouxiang Hu whose telephone number is 571-272-1654. The examiner can normally be reached on Monday through Thursday, 7:30 AM to 6:00 PM.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Eddie C. Lee can be reached on 571-272-1732. The fax phone number for the organization where this application or proceeding is assigned is 703-872-9306.

Art Unit: 2811

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

SH

August 19, 2004



**SHOUXIANG HU**  
**PRIMARY EXAMINER**